Sink or Float? Density vs. Displacement

By Grace Robinson

You will need:

1 tub of water

Oil-based modeling clay or polymer modeling clay

Instructions

1. Mold a portion of the clay into a ball. Will it sink or float. Put it in the tub of water and notice what happens.

2. Mold the clay into a shape that will allow it to float. **TIP:** If you're not sure what that shape would look like, think about how you float in a lake or pool. Would you be spread out and flat? Use this idea to reshape your clay.

3. Put it in the tub of water. Did the clay sink or float after you reshaped it? Redesign as many times as you need to until your clay floats on the water.

Discussion

In this experiment, the density of the clay stays the same. Only the displacement (the pushing aside) of the water changes. *Archimedes' Principle* says that an object placed in fluid will be held up by a force equal to the weight of the fluid that it displaced. The gravitational force pulling the object into the water is equal to the weight of the object. For that object to float, it must displace a volume of water greater than or equal to the weight of the object.

Citation:
https://www.playdoughtoplato.com/clay-

When the clay was shaped in a ball, did it displace a volume of water greater than, equal to, or lesser than its weight? How did reshaping the clay help it float?